

Amendment Under 37 C.F.R. § 1,111  
Serial No. 10/720,167  
Attorney Docket No. 032133

**REMARKS**

Claims 1-7 are pending in the above-identified application. Claims 1 and 3 are amended. Claim 2 is cancelled. No claims are added.

The Examiner rejected claims 1 and 2 under 35 U.S.C. § 103(a) as being unpatentable over *Ruff et al.* (U.S. Patent No. 3,688,883) in view of *Murata et al.* (U.S. Patent No. 5,983,657). Applicants amend independent claim 1. It is believed that the Listing of Claims on page 2 distinguishes over the cited art for at least the following reasons. Accordingly, withdrawal of the rejections is now solicited.

An object of the present invention is to provide a refrigeration system whereby, while an automotive air conditioner is not in use, refrigerant does not leak out into a vehicle compartment even if an evaporator or piping arranged in the vehicle compartment is damaged [page 2, line 22 – page 3, line 1]. To accomplish this objective, the present invention provides *a refrigeration system including an evaporator arranged in a vehicle compartment, the refrigeration system being characterized by comprising a solenoid valve arranged at an inlet of the evaporator and capable of shutting off a refrigerant passage between an expansion valve and the evaporator when operation of the system is to be stopped and during stoppage of the operation, and a check valve arranged at an outlet of the evaporator, for preventing a refrigerant sucked by a compressor when the operation of the system is to be stopped, from flowing back into the evaporator during the stoppage of the operation* [Claim 1].

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The Examiner acknowledges that *Ruff et al.* does not teach a check valve 79 being at an outlet of the evaporator. *Ruff et al* does not teach this limitation because the check valve is intended to prevent migration of vapor back through the compressor [column 6, lines 51-52], rather than to prevent migration of refrigerant back through the evaporator. The present invention is specifically concerned with migration of refrigerant back through the evaporator because if the refrigerant leaks because of damage to the evaporator arranged in the vehicle compartment or to piping installed in the vehicle compartment, the occupants can possibly be put in a grave situation such as suffocation due to deficiency of oxygen or outbreak of fire [page 2, lines 12-19].

The Examiner incorrectly relies upon *Murata et al* to suggest modifying the *Ruff et al* system to have a check valve 29 between the evaporator 8 and the compressor 25 to prevent reverse flow into the evaporator (column 4, lines 49-52). In doing so, the Examiner fails to provide sufficient motivation to combine the references for such a modification. The Examiner does not indicate which parts of the *Murata et al* disclosure the Examiner relies upon to supposedly suggest modifying the *Ruff et al* system to have the additional elements claimed by applicant to thereby render the claims obvious. The only reason that the Examiner recites for such a modification is that “it would have been obvious...for the common purpose or [sic, of] preventing refrigerant back flow into the evaporator” [Office Action, page 3].

The Examiner acknowledges that *Ruff et al.* is not directed toward a refrigeration system for use in either a vehicle compartment or an automobile [Claims 1 and 3]. Thus, it would not

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have been obvious to one of ordinary skill in the art at the time the invention was made to place a check valve between the evaporator and compressor of *Ruff et al.* for preventing refrigerant back flow into the evaporator thereby reducing the harm of suffocation due to deficiency of oxygen or the outbreak of fire in a vehicle compartment. Accordingly, claim 1 is allowable.

The Examiner rejected claims 3-5 under 35 U.S.C. § 102(b) as being anticipated by *Ruff et al.* Applicants amend independent claim 3. It is believed that the Listing of Claims on page 2 distinguishes over the cited art for at least the following reasons. Accordingly, withdrawal of the rejection is now solicited.

Contrary to the Examiner's statement that all elements are disclosed in the *Ruff et al.* reference, an automobile air conditioner is not, so the claim 3 rejection is unsupported by the art and should be withdrawn. The Examiner acknowledges that *Ruff et al.* does not specifically disclose use in an automotive air conditioner. The body of claim 3 refers to "the automotive air conditioner." Therefore, the limitation, "the automotive air conditioner", "breathes life" into the preamble, and must be given patentable weight. Accordingly, withdrawal of the rejection is now solicited.

Contrary to the Examiner's statement that all elements are disclosed in the *Ruff et al.* reference, *Ruff et al.* does not disclose *that the collection of the refrigerant is carried out by shutting off a refrigerant passage on an inlet side of the evaporator and operating a compressor for a predetermined time to suck in the refrigerant from the evaporator through a check valve*, therefore the claim 4 rejection is unsupported by the art and should be withdrawn. On page 3 of

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the Office Action, the Examiner acknowledges that *Ruff et al.* does not teach a check valve 79 being at an outlet of the evaporator. The above-identified application, for example, discloses a check valve arranged at an outlet of the evaporator [page 3, lines 10-11].

Applicant appreciates the indication that claims 6 and 7 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. However, for the reasons detailed above, it is believed that all claims are allowable.

In view of the aforementioned amendments and accompanying remarks, Applicants submit that the claims, as herein amended, are in condition for allowance. Applicants request such action at an early date.

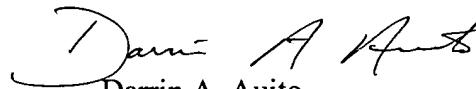
If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact Applicants' undersigned attorney to arrange for an interview to expedite the disposition of this case.

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If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,

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